

# Annual Report and Supplemental Recommendations

*Presented to  
The Miami-Dade  
Board of County Commissioners  
April 2010*

Miami-Dade County  
Climate Change Advisory Task Force  
(CCATF)





## MIAMI-DADE COUNTY

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*Mayor*

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*County Manager*

**Robert A. Cuevas Jr.**

*County Attorney*

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## Chairman's Letter

### CLIMATE CHANGE ADVISORY TASK FORCE ANNUAL REPORT

*"The potentially empowering capacity to be able to "foresee and forestall" is what ultimately distinguishes the human specie from all others..."*  
*Carl Sagan, Legendary Futurist*

I am pleased to submit this Annual Report on behalf of the appointed members of the Climate Change Advisory Task Force (CCATF) and to once again thank the Board, the Mayor and the Manager for the humbling opportunity to work alongside the thoroughly committed, highly knowledgeable and eminently distinguished individuals YOU have appointed. Many of whom have international reputations –all are proud to be working hard on behalf of our County.

This report and its twenty two (22) recommendations are a work product, emerging from over 5,000 person/hours of in-depth presentations and robust debate among nearly 200 volunteers and stakeholders in some 50+ meetings of the Task Force Committees (See Appendix 1 for Committee Structure and Missions), as well as three full CCATF meetings in 2009. All meetings were publicly noticed and minutes posted on our website: [www.miamidade.gov/derm/climatechange/taskforce.asp](http://www.miamidade.gov/derm/climatechange/taskforce.asp). In addition, countless staff time has gone into preparation and follow through.

The specific recommendations speak well for themselves. Many call on the Board to use its role as the County's Advocate to State and Federal levels of government. Some call for specific actions to be considered by the Board itself.

Overarching themes relate to smart growth policies, energy and water conservation, and the need for sea level/infrastructure mapping for tracking purposes. Several relate to the compelling need to educate and reach out to both the general public and the business community.

All of the recommendations fully deserve careful review and follow-through by the Board. I would like to highlight one in particular, for which the Board has already taken action with R-747-09 in April 2009, in harmony with the Task Force proposal. Recommendation E-5 calls for the County to undertake a major initiative to create GREEN JOBS, which would not only provide for retaining of out of work construction workers, but focus as well on low-income neighborhoods where unemployment is highest. Making climate action more inclusive and creating green jobs is a logical synergy. This can be done on a regional basis which could be an element in our called for participation in the Regional Climate Compact, which the County signed three months ago. The recommendation also calls for the establishment of a GREEN JOBS Task Force to build and implement an action plan.

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The twenty two (22) new recommendations supplement the initial thirty-five (35) recommendations presented to the Board in April of 2008. Appendix II is a status report on the initial recommendations based on information provided by Susie Torriente, who ably heads the County's Office of Sustainability (OOS). Expanding the duties of the OOS and moving towards a County-wide sustainability effort along with the GREENPRINT initiatives (including a Vital Signs Monitoring Program) are all major called for pluses.

Miami-Dade has been a leader among local governments worldwide. First in helping to found the International Council for Local Environmental Initiatives (ICLEI) in 1990 and start a global movement of local governments committed to "thinking globally and acting locally" and NOW our County's efforts in both mitigation and adaptation planning are leading the way.

Your commitment to this process is evolving so that our duty to anticipate Climate Change impacts and take the necessary actions to maximize our resiliency will one day be your badge of honor.



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Harvey Ruvin, Chairman

**Miami-Dade County  
Climate Change Advisory Task Force  
December 2009**

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## **Appointed Members**

*Clerk Harvey Ruvin, Chairperson*  
*Mr. Jim Murley, Vice-Chairperson*

Mr. Rich Candia, Leo A. Daly

Dr. Adriana Cantillo, Chemist, National Oceanic and Atmospheric Administration (Retired)

Ms. Carolyn Dekle, Executive Director, South Florida Regional Planning Council

Mr. Marcus A. Frankel, President, Frankel Benayoun Architects, Inc.

Mr. Jose Fuentes, South Florida Director, The Fuentes Consulting Group, LLC

Ms. Jane Gilbert, High Impact Integrated Solutions

Dr. Hugh Gladwin, Director, Institute of Public Opinion Research, Florida International University

Ms. Cynthia Guerra, Program Director, Environmentally Endangered Lands, Miami-Dade County

Mr. Alberto Harum-Alvarez, SmallCo

Mr. Ed Hernandez, South Florida Water Management District Regional Service Center Director

Mr. Dan Kimball, Superintendent, Everglades National Park

Capt. Dan Kipnis, Director At Large, Florida Wildlife Federation

Mr. Arsenio Milian, President, Milian, Swain & Associates, Inc.

Mr. Tony Moss, Esquire, Law Office of Tony Moss, Inc.

Mr. Jim Murley, Director, Center for Urban & Environmental Solutions, Florida Atlantic University

Mr. Guillermo Olmedillo, Urban & Regional Planner, OLMEDILLO X 5, Inc.

Dr. Jack Parker, Environmental Studies Department, Florida International University

Mr. Richard Pettigrew, Former Chair, Governor Chile's Commission on a Sustainable South Florida

Ms. Elizabeth Plater-Zyberk, Principal, Duany Plater-Zyberk & Company, LLC

Mr. Rafael Rodon, Executive Vice President, Flagler Development

Mr. Manny J. Rodriguez, P.E., Miami Dade Regional Director, Florida Power and Light

Mr. Harvey Ruvin, Clerk of Courts, Miami-Dade County

Dr. Hal Wanless, Professor and Chair, Department of Geological Sciences, University of Miami

Dr. Keqi Zhang, Director, Laboratory for Coastal Research, Florida International University

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## **Supplemental Recommendations**

These twenty two (22) supplemental recommendations, made at the CCATF committee level, were discussed and unanimously approved by the Miami-Dade Climate Change Advisory Task Force (CCATF). These recommendations are in addition to the Initial Recommendations made as part of the Second Annual Report to the Miami-Dade Board of County Commissioners (BCC) in April 2008. The supplemental recommendations include mitigative and adaptive strategies, but each also has components for educating the residential and business communities. The recommendations are numbered to follow the Initial Recommendations from the Second CCATF Report, which is published on the CCATF web site: <http://www.miamidade.gov/derm/climatechange/taskforce.asp>

### **B. Greenhouse Gas Reduction**

**Recommendation B11:** (approved CCATF Feb 20, 2009)

The Climate Change Advisory Task Force supports the “Resolution endorsing Miami-Dade County’s participation in U.S. Cool Counties Program and its goals and objectives including the Climate Stabilization Declaration”, sponsored by Commissioner Natacha Seijas and approved by the Board of County Commissioners on December 16, 2008. The Task Force further recommends that Miami-Dade County implement the following steps to ensure their ability to meet the Cool Counties greenhouse gas reduction commitments:

- i. Commit to a 20% reduction in GHG emissions by 2020 through an annual 2% reduction from the base year of 2005 for both County government and County-wide GHG emissions. Provide annual reporting on greenhouse gas emissions for the County government and Countywide GHG emissions. This annual report should include steps taken to reduce GHG emissions internally and geographically, results, and steps needed to meet the next year target.
- ii. Recognize this commitment takes dedicated resources to develop, implement and report on these plans. The County Manager intends to adequately resource this initiative to achieve targets established in the Cool Counties resolution and in paragraph (i) of this resolution.
- iii. The County establish a countywide alliance of municipalities and large corporations, public and nonprofit institutions that will need to collaborate in order to meet previously established targets. This consortium will be used to:
  - a. Enlist partners to explicitly adopt all primary goals of the Cool Counties GHG reduction targets and to report on their own GHG reductions.
  - b. Identify and implement strategies for the financing and performance of energy efficiency and renewable energy upgrades in Miami Dade County/South Florida,

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- c. Increase purchasing power of energy efficiency related financing, services and products, and
- d. Enlist partners to assist with the dissemination of information and incentives designed to assist individuals and small businesses in meeting these reduction goals. (This alliance could also be used to coordinate Countywide adaptation efforts)

#### **Recommendation B.12:** (approved CCATF January 22, 2010)

The CCATF recommends that Miami-Dade County implement the following in order to promote energy conservation and efficiency in buildings owned by Miami-Dade County:

- Conduct a feasibility study and develop a plan for retrofitting all County-owned outdoor lighting to high efficiency lighting technologies. The study should include a review and summary of current standards and case studies of implementation in other communities. High efficiency light options to be considered may include: Light emitting diodes (LED), induction lighting, with a preference given to solar powered lights. Additionally, an evaluation should be made to improve the efficiency of outdoor lighting with the goal to reduce non-essential outdoor lighting during daytime hours.
- Require that all county buildings that annually consume more than 500,000 kilowatt hours (kwh) and have not received a comprehensive energy audit in the last 5 years, receive a comprehensive energy audit and/or retro commissioning, with the intent of identifying energy saving and carbon footprint reducing opportunities.
- Require that all County departments include their goals and plans for greenhouse gas reduction and climate change adaptation in their strategic plans and that each Department Director's performance evaluation include a reporting on outcomes. Present sustainability award to Departments and Directors that achieve most impressive results. One department (e.g., Office of Sustainability, DERM and/or GSA) could be responsible for providing strategies, tools and resources to each department to assist departments in achieving their reduction goals.

*Rationale: The CCATF applauds the leadership of the County Commission with the adoption of Resolution R-228-09 (Resolution to Reduce Miami-Dade County's Electrical Energy Consumption). This recommendation further supports the goals of that resolution.*

#### **Recommendation B.13:** (approved CCATF January 22, 2010)

The CCATF recommends that Miami-Dade County continue to support funding opportunities available through the American Recovery and Reinvestment Act (ARRA) and other federal programs to retrofit homes, commercial, and housing facilities for energy and water efficiency, and educate residents and homeowners about conservation. The following should be included in order to optimize, leverage, and facilitate energy conservation federal programs and funding.



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- Incorporate educational, behavioral, and operational training programs with all retrofit and renovation options.
- Monitor and analyze results of retrofits to include but not be limited to obtaining an energy rating of all renovated homes and public housing facilities.
- Use some or all of the funds created from the resale of foreclosed and renovated homes for further development and promotion of energy and water efficiency outreach programs.
- Maximize the use of Smart Meters to monitor results and compliment behavioral programs.

*Rationale: Programs to consider should include, but not be limited to, the Neighborhood Stabilization Program, Weatherization programs, Public Housing Capital improvements, Community Development Block Grants, Community Services Block Grants, and homelessness prevention.*

#### **Recommendation B.14:** (approved CCATF January 22, 2010)

The CCATF recommends that Miami-Dade County develop incentives for energy and water efficiency, conservation, and distributed low- and no-carbon energy generation for existing residential, industrial, and commercial buildings. The CCATF recommends that the County:

- Explore development of a public/private partnership that would provide financing and technical assistance to smaller scale commercial, multifamily and residential facilities to retrofit homes for improved energy and water efficiency. This should support current and future technologies (e.g., metered charging stations in parking garages for electric vehicles and roof hook ups for PV, and, where feasible, the installation of renewable energy technologies such as solar water heaters).
- In the short term, identify potential partners to develop and implement a financing solution for solar water heaters similar to Lakeland Electric.
- Analyze and maximize GHG reduction opportunities through all county services to residents and businesses.
- Work with FPL on the installation of a real-time, web-based smart meter program in County government and other large public institutions.
- Promote the use of green roofs, e.g. vegetative roofing, high reflectivity roofing materials, etc.
- Include solar reflectance, emissivity and Solar Reflectance Index (SRI) values into the roof system product approval process.

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- Develop incentives for retrofitting buildings to accommodate energy-saving additions such as PV panels on rooftops and metered charging outlets/stations in parking garages for electric vehicles.
- Develop incentives for the addition of customer-paid electric vehicle (EV) charging stations in portions of public and county-run parking lots.
- Consider a demonstration retrofit of a County-owned building that could be used as a public outreach and education vehicle for promoting energy-saving retrofits.

#### **Recommendation B.15:** (approved CCATF January 22, 2010)

The CCATF recommends that Miami-Dade County educate the business sector and the public on energy and water efficiency and conservation. The CCATF recommends that this would best be accomplished if Miami-Dade County collaborates with corporate, nonprofit, and educational organizations to develop a broad scale and culturally competent media and community based educational campaign dedicated to promote the adoption of conservation, efficiency and renewable behaviors, systems and technologies in residences and businesses.

CCATF suggests that this educational campaign should:

- Inform residents and the business sector of the economic benefits of, and resources available for, energy efficiency and appropriate renewable technologies (e.g., green roofs, solar water heaters, smart meters, etc.).
- Develop two separately designed and targeted campaigns and approaches: one for residents and one for business. For consumer/resident examples, refer to the Home Energy Saver (attached) and Green Homes Challenge (attached) descriptions. For a business example see [www.e4s.org](http://www.e4s.org), the Entrepreneurs for Sustainability website.
- As part of this education campaign, include information about the Energy Gauge performance rating system for new and existing commercial and residential buildings and encourage property buyers to ask for the rating.

#### **Recommendation B.16:** (approved CCATF January 22, 2010)

The CCATF recommends that Miami-Dade County undertake an assessment of the County's water and sewer rates and conservation/efficiency programs. The County should:

- Conduct a long term comparative cost/benefit analyses on the combination of increasing electricity and water generation vs. ramping up conservation and efficiency programs. The

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CCATF recognizes that both options may be necessary but a preference should be given to increasing conservation and efficiency.

- Provide consumer education on the current comparatively low rates they have enjoyed and the need for increasing rates to pay for efficiency and conservation efforts. The goal of this education is to build voter acceptance that increased rates are essential to maintaining and improving the quality of life here.
- Determine the feasibility of using Miami-Dade County's Water and Sewer Department (WASD) facilities for installation of renewable energy technologies, including for water and sewer operations.

*Rationale: WASD is the County's highest consumer of electricity and one of the highest consumers in the State of Florida. In addition, our community's resiliency depends on a reliable water supply. Miami Dade's water and sewer rates are considerably lower than those found elsewhere in the state. Miami Dade County's commercial and residential sectors need to recognize the long term projected costs and increases in energy use associated with increased treatment, disposal and reclamation regulations, and of increased water demand (with and without aggressive conservation and efficiency programs).*

**Recommendation B.17:** (approved CCATF January 22, 2010) (complemented by C.9)

Recognizing that support at the state and federal level are important in facilitating action at the local level, the Climate Change Advisory Task Force recommends that Miami-Dade County advocate that:

- The Florida Public Service Commission require FPL to achieve at least a 20% reduction in GHG generation from the 2005 baseline by 2020. This would include incorporating the costs of the proposed nuclear power plants by Florida Power and Light at Turkey Point in the comparative costs and benefits of energy efficiency and renewable energy systems and improve and expand incentive structures for energy efficiency, energy conservation and renewable generation. These incentive structures need to promote both customer owned and utility owned energy efficiency and demand side renewable energy systems. Additionally, the cost benefit analysis needs to place a greater emphasis on reducing overall energy consumption, not just capacity reduction, to achieve greater reduction in greenhouse gas emissions.
- The Florida Building Commission, the Energy Technical Advisory Committee, and the 2010 Energy Code Work Group work to ensure that new construction and significant renovations and replacement equipment requirements increase energy efficiency and promote renewable by requiring a combination of methods and elements to include: solar water heaters, photovoltaic panels, shading devices, vegetative roofing, controllers and monitoring equipment, best practices and quality installation procedures such as HVAC sizing and duct testing, pre-wiring of buildings to accommodate future GHG reducing

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technologies such as monitoring devices, HVAC zoning, centralized data centers and distributed renewable power sources on rooftops and metered charging outlets in parking garages for electric vehicles. Advocate for the use of green building standards including the National Association of Homebuilders' (NAHB) Green Building Standards and the Florida Green Building Coalition as one of several model options that can be used to reduce GHG emissions and promote energy efficiency.

- Florida and/or the United States pass an energy efficiency resource standard (EERS), a target that will help utility companies reduce electricity usage by 15%.
- State and Federal Renewable Portfolio Standards of at least 20% by 2020 be implemented.
- The Federal Clean Energy bill includes a goal of reducing GHG reduction by 20% from 2005 by 2020. (This would parallel's the County's current target.)
- Federal appropriations for the Energy Efficiency Conservation Block Grant (EECBG) program are continued, at least at current levels.

*Rationale: Miami-Dade County Board of County Commissioners approved a resolution to adopt the goals and objectives of the US Cool Counties Program on December 16, 2008. This includes a commitment to work closely with local, state, and federal governments and other leaders to reduce county geographical Greenhouse Gas (GHG) emissions to 80 percent below current levels by 2050 and to reduce GHG emissions by 20 percent by 2020. This set of recommendations is intended to provide specific steps to help the County meet these goals. Without federal and state policies and initiatives that, at a minimum, meet and support these reduction targets, Miami-Dade County and other local governments will bear an undue burden of responsibility for climate change mitigation.*



## ***Home Energy Saver***

### **THE NEED**

Dream in Green's Home Energy Saver provides moderate to low-income households with solutions to reducing their energy and water bills. Consumer energy consumption is responsible for over 50% of all energy used in Florida. Reducing household energy consumption is one of the best ways to reduce carbon dioxide emissions and help reverse the trend of global climate change. It also saves money on rising energy costs! The most cost-effective and immediate way to reduce energy consumption is through personal behavioral changes and simple weatherization.

### **THE WEATHERIZATION PROGRAM**

The Home Energy Saver Weatherization Program is a 1-1.5 hour workshop that can work in conjunction with Miami-Dade County's weatherization program to provide participants in the weatherization program with low and no cost measures to save energy and water in their homes. It will also provide participants with information on how to operate and maintain their home after the weatherization retrofits. Specifically, the workshop will provide:

1. An overview of no cost behavioral methods to reduce energy and water;
2. An overview of how to operate their home in an energy and water efficient ways following weatherization retrofits;
3. An overview and demonstration of further retrofit options for saving energy and water at home;
4. An overview of local, state and federal rebates and tax incentives for purchasing energy and water conservation products;
5. Follow-up post-weatherization to track energy and water savings.

### **THE VOUCHER PROGRAM**

The Home Energy Saver Voucher Program is a 2-hour workshop that provides low to moderate income households not eligible or able to participate in the weatherization program with tools to reduce energy and water use in their homes. Specifically, the workshop will provide:

1. Information about no cost ways to conserve energy and water;
2. An overview and demonstration of low cost methods to reduce energy that participants can install themselves, such as weather stripping, applying sealants,



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installing reflective film on windows, cleaning and maintaining an air conditioner, and installing a programmable thermostat;

3. An overview and demonstration of low cost methods to reduce water such as installing faucet aerators, low flow showerheads, and rain sensors;
4. An overview of further retrofit options for saving energy and water at home;
5. An overview of local, state and federal programs, rebates, and tax incentives for purchasing energy and water conservation products;
6. \$100 - 200 credit voucher to purchase energy and water conservation products.

At the end of the program attendees will develop their own plan for saving 20-40% on their utility bills (avg. savings of \$500-\$1000/yr). When the attendees redeem their credit voucher, a customer service agent will assist them in purchasing the right products for their home. Dream in Green will provide follow-up with participants to determine whether products have been purchased and installed and track energy and water savings.

#### **DREAM IN GREEN'S ROLE**

Dream in Green will:

1. Design and lead workshops;
2. Recruit program partners, including: local retail stores to partner on voucher program, Florida Power & Light, Miami-Dade Water & Sewer Department, South Dade Soil & Water Conservation District, and the University of Florida/Miami-Dade County Extension Service;
3. Follow-up with attendees to track energy and water saved and behaviors changed;
4. Promotion of the Home Energy Saver program.

#### **LOCAL GOVERNMENT PARTNERS**

In addition to providing funding, local government partners will support the access and recruitment of participants and promotion of the Home Energy Saver program.

#### **ABOUT DREAM IN GREEN**

Dream in Green is a local nonprofit organization mobilizing our community to collectively respond to challenges faced by global climate change and energy security.

Dream in Green's Green Schools Challenge (GSC) is now operating in over forty-three schools in Miami-Dade County. The goals of the GSC are to:

1. Educate students about energy and global climate change;
2. Engage students in directly reducing the carbon footprint of their school and home through reducing energy, waste and water and planting trees;
3. Save the school system money on energy costs.

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In 2007/08, schools participating in the Green Schools Challenge:

- Saved over \$150,000 while conserving 653,667 kWh of electricity
- Recycled over 87,000 pounds of paper.
- Planted over 540 native trees.
- Reduced, sequestered and offset nearly 1,200,000 pounds of carbon dioxide.

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## ***Green Homes Challenge***

### **THE NEED**

Dream in Green's **Green Homes Challenge** is a community-based energy and water conservation program that provides households with everyday solutions to addressing environmental and energy concerns. Most scientists agree that greenhouse gas emissions from the burning of fossil fuels are impacting global air and sea temperatures and creating global weather pattern changes. Florida's 1,200 miles of coastline makes it especially vulnerable to the effects of unchecked global climate change, whether from rises in sea level, more intense hurricanes, rising temperatures, or habitat destruction.

Consumer energy consumption is responsible for over 50% of all energy used in Florida. Reducing household energy consumption is one of the best ways to reduce carbon dioxide emissions and help reverse the trend of global climate change. It also saves money on rising energy costs! **The most cost-effective and immediate way to reduce energy consumption is through personal, behavioral changes.**

### **THE PROGRAM**

The Green Homes Challenge is based on community social marketing principles and utilizes household EcoTeams that serve as a peer support group for completing the Green Homes household carbon-reduction program. Like a Weight Watchers support group, EcoTeams follow a series of structured meetings guiding participants through carefully crafted energy, water and waste reduction actions.

The Green Homes Challenge is simple and strategic. A household community group (such as members of a neighborhood or condo association, a PTA, religious or civic organization) form an EcoTeam which will agree to meet six times over a three-month period with the help of a step-by-step workbook and a trained coach provided by Dream in Green.

Choosing from a series of practical actions, the team supports one another to reduce energy consumption and encourage other neighbors to get involved. More than increasing awareness, the Green Homes Challenge enables people to change the way they live – measurably. The Challenge also builds community and social capital – people meet their neighbors and begin acting as a community, often for the first time.

Depending upon the community, participants in the Green Homes Challenge can achieve the following average resource savings per year:

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- 20% - 40% less energy used
- 35% - 51% less garbage sent into the waste stream
- 25% - 34% less water used
- 16% - 20% less fuel used for transportation
- \$1,000 - \$1,500 saved annually

#### **DREAM IN GREEN'S ROLE**

Dream in Green will:

1. Recruit program partners;
2. Provide training for EcoTeam "initiators" to lead a neighborhood EcoTeam, including a step-by-step workbook to guide the process;
3. Technical support, as needed, during neighborhood meetings;
4. Ongoing support throughout the process, including technical information and access to local resources;
5. Tracking of energy saved and behaviors changed;
6. A website for participants to access and exchange information and resources and track energy and water saved and reduction of their carbon footprint using Dream in Green's Greenometer;
7. Green prizes for winning households;
8. Promotion of the Green Homes Challenge;
9. Resources for EcoTeam Leaders to continue dissemination of the program and form additional EcoTeams.

Dream in Green will work with multiple partners to leverage resources and multiplier effects of the program, including partnering with:

1. Local universities to evaluate and design program messaging and outcomes;
2. Florida Power & Light to provide information on rebates, incentives and retrofits;
3. Miami-Dade County to provide information on water saving rebates and retrofits, waste reduction, recycling, and tree planting initiatives;
4. South Dade Soil & Water Conservation District and the University of Florida/Miami-Dade County Extension Service to provide information on home landscape irrigation water savings and evaluation programs;
5. Local companies to provide rebates or discounts for energy and water efficient supplies;
6. Home energy raters and contractors to provide discounts on home energy rating and retrofits.

#### **LOCAL GOVERNMENT PARTNERS**

In addition to providing funding, local government partners will support the access and recruitment of participants and promotion of the Green Homes Challenge.



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## **ABOUT DREAM IN GREEN**

Dream in Green is a local nonprofit organization mobilizing our community to collectively respond to challenges faced by global climate change and energy security. Dream in Green's Green Schools Challenge (GSC) is now operating in over forty-three schools in Miami-Dade County. The goals of the GSC are to:

1. Educate students about energy and global climate change;
2. Engage students in directly reducing the carbon footprint of their school and home through reducing energy, waste and water and planting trees;
3. Save the school system money on energy costs.

In 2007/08, schools participating in the Green Schools Challenge:

- Saved over \$150,000 while conserving 653,667 kWh of electricity
- Recycled over 87,000 pounds of paper.
- Planted over 540 native trees.
- Reduced, sequestered and offset nearly 1,200,000 pounds of carbon dioxide.

## **ABOUT COMMUNITY-BASED SOCIAL MARKETING**

Most initiatives to foster sustainable behavior rely upon large-scale information campaigns that utilize education and/or advertising to encourage behavior change. While education and advertising can be effective in creating public awareness and in changing attitudes, numerous studies show that behavior change rarely occurs as a result of simply providing information.

Community-based social marketing is an alternative to information-based campaigns. It is based upon research in the social sciences that demonstrates that behavior change is most effectively achieved through initiatives delivered at the community level which focus on removing barriers to an activity while simultaneously enhancing the activities benefits (Doug McKenzie-Mohr, [www.cbsm.com](http://www.cbsm.com)).



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## **C. Built Environment Adaptation**

### **Recommendation C.4:** (approved CCATF January 22, 2010)

The CCATF recommends that Miami-Dade County use the on-going cycle of the Evaluation and Appraisal Report to include amendments to the Comprehensive Development Master Plan that will further the principles of Smart Growth ([www.smartgrowth.org/default.asp](http://www.smartgrowth.org/default.asp)).

*Rationale: Land use and development patterns contribute to greenhouse gas emissions from buildings, transportation and water consumption.*

### **Recommendation C.5:** (approved CCATF January 22, 2010)

The County should begin a process of planning and public education, coordinated with the South Florida Regional Planning Council and the Metropolitan Planning Organization that integrates the mapping of projected sea level rise and storm surge impacts with the locations of infrastructure and other public investment, and with the locations of projected growth and development. The goal is to ensure the safety and resilience of public investment, and to consolidate private investment on transit-served high ground.

*Rationale: The interrelated nature of climate change mitigation and adaptation requires a geographically based planning process to facilitate decision-making. Mitigation of greenhouse gas emissions requires changes to building design and development patterns at large. Adaptation requires mapping of storm surge and sea level rise effects, with overlays of location and elevations of built investments. Because both cases involve potential changes to private, public and not-for-profit properties, the need to build political will through a process of public information and engagement is critical.*

### **Recommendation C.6:** (approved CCATF January 22, 2010)

The CCATF recommends that Miami-Dade County (by its departments of Planning and Zoning, DERM, MPO, and Public Works) develop a memorandum of understanding for integrated planning efforts with the Florida Department of Transportation and the South Florida Regional Planning Council.

### **Recommendation C.7:** (approved CCATF January 22, 2010)

The CCATF recommends that Miami-Dade County develop mandates and incentives for building designs that meet green building standards such as those established by Energy Star, the Florida Green Building Coalition, the U.S. Green Building Coalition (USGBC) Leadership in Energy and Environmental Design (LEED) or the National Association of Home Builders (NAHB) Green Building Standards. These standards must comply with the Florida Building Code and not conflict with the Comprehensive

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Development Master Plan. If the County does develop such mandates and incentives, the CCATF further recommends that:

- Buildings eligible to receive an EPA rating using Energy Star's Portfolio Manager, should achieve an energy performance rating of at least 70.
- Buildings not eligible to receive an EPA rating using Portfolio Manager, demonstrate energy efficiently in at least the 20<sup>th</sup> percentile for typical buildings of similar type using benchmarking against national median energy source data provided in the Portfolio Manager tool.

**Recommendation C.8:** (approved CCATF January 22, 2010) (complemented by B.17)

The CCATF recommends that Miami-Dade County advocate for amendments to the Florida Building Code that will reduce the impact of greenhouse gas emission and improve climate change resiliency.

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## **E. Economic, Social, and Health Adaptation**

**Recommendation E.5:** (approved April 30, 2009 and implemented by Miami-Dade in January 2010)

The CCATF recommends the following in reference to green jobs and the economy:

1. The County should sign the Local Government Green Jobs Pledge (attached).
2. The County establish a full Green-collar Jobs Task Force. This committee should promote green jobs and building a local green economy as follows:
  - Establish a local action plan for Miami-Dade County,
  - Identify goals and opportunities, and
  - Identify key partners, both governmental and NGO's, for sharing best practices and resources.

Rationale:

*In order to help boost the local economy and foster a more sustainable community, the creation of green jobs strategy is suggested, to help deal specifically with climate change adaptation and mitigation. A successful strategy will create communication, collaboration, and coordination between the key stakeholders and bring all necessary stakeholders together including businesses, home builders, retrofitters (demand side), training/certification programs, technical institutions, and non-profit organizations (education), along with key government agencies.*

Desired Outcomes:

1. Create a sizeable and competent workforce to meet Miami-Dade County's GHG targets.
2. Create good jobs and an inclusive economy that not only retrain individuals from the construction industry who are currently unemployed due to the economic downturn, but also provides employment opportunities for people with barriers to employment (individuals from low-income neighborhoods, people with an incarceration record, and folks with educational issues).
3. Lower GHG emissions in Miami-Dade County.

**Recommendation E.6:** (approved CCATF January 22, 2010)

The CCATF recommends that Miami-Dade County initiate efforts for a county-wide assessment of local public knowledge and opinion on climate change. The effort should:

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## Miami-Dade County Climate Change Advisory Task Force

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- Review and assess existing data on local public knowledge and opinion related to climate change (both mitigation and adaptation), and
- Supplement available data through additional polling, attitude research, and other appropriate information gathering methods.

Rationale Desired Outcomes: See rationale and desired outcomes below under Recommendation E7: (County-wide Educational Outreach Program on Climate Change).

#### **Recommendation E.7:** (approved CCATF January 22, 2010)

The CCATF recommends that Miami-Dade County take the following steps to facilitate a county-wide education outreach program on climate change to educate the general public:

- Step I - review and assess existing entities (such as internal County departments, Miami-Dade County Environmental Education Providers consortium, local colleges and universities, etc.) that could provide education on climate change
- Step II - coordinate relevant entities identified through Step # I in order to share information gathered as a result of County-wide Assessment of Local Public Knowledge and Opinion on Climate Change (as outlined in #1)
- Step III - direct funding and resources to relevant entities identified through Step # I

*Rationale: Research tells us that people are concerned about climate change and its potential effects. However, local residents, in many cases, have no clear idea of climate change implications for South Florida. It is essential that residents have a realistic understanding of what is going to happen and what they can do to participate in and support climate change adaptation and mitigation efforts. It is also important that residents are not unduly influenced by sensationalized news media concerning these issues. Leaving public outreach and education to a later date or to other entities risks having confusion and misinformation spread, and also jeopardizes the critical public support and participation that the County needs to successfully meet the challenges of climate change. The County must begin now to organize and mount a public outreach and education effort to prepare for climate change. County staff should establish clear objectives and success metrics for this public outreach and education effort and report back to the County Commission as it proceeds.*

Desired Outcomes: An effective educational outreach program would result in the following:

- Residents would gain a basic understanding of the science of climate change and the impact of climate change on South Florida.
- Behavioral changes would result in lower green house gas emissions.
- Public support would be gained for necessary government action to mitigate/adapt to climate change.



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## LOCAL GOVERNMENT GREEN JOBS PLEDGE

The 21st century is our time to build an inclusive green economy in the United States that benefits our neighborhoods, our working families and our planet. Our green future will be invented at the local level and crafted by local leaders, and our actions will provide an example and a challenge to our state and federal governments. We are ready to rebuild American competitiveness and environmental leadership by growing a green economy that fights global warming, pollution and poverty at the same time.

### **AS LOCAL GOVERNMENT LEADERS, WE COMMIT TO:**

**Focus on green-collar jobs as a central strategy for advancing environmental, economic, and climate protection goals. Green-collar jobs:**

- Provide pathways to prosperity for all workers;
- Offer competitive salaries and lead to a lasting career-track, thereby strengthening the US middle class;
- Emphasize community-based investments that cannot be outsourced;
- Contribute directly to preserving or enhancing environmental quality.

### **Grow an inclusive sustainable economy that creates green-collar jobs that:**

- Strengthen and make further progress on our stated commitment to improving the environment in ways that grow both the green economy and green-collar jobs locally;
- Build on climate and environmental commitments to create market demand for green products, services, and skilled workers and create more prosperous local economies;
- Catalyze green-collar job creation and training by supporting policies that drive public and private investment in an inclusive local green economy; and
- Develop education and job training programs that improve social equity and provide pathways out of poverty for our residents while strengthening our middle class by equipping workers for high demand jobs in the green economy.

### **Execute tangible actions that place priority on building an inclusive green economy that will:**

- Involve our communities in developing and enacting green-collar jobs initiatives;
- Drive accountability and resolve to continuously improve and strengthen our efforts to invest in climate solutions that create economic opportunity and build sustainable communities;
- Provide accessible leadership that is responsive to our communities as we evolve the green economy;
- Use the purchasing power of our local governments to create markets for renewable energy, energy efficiency and other green industries; and
- Invest new local government resources in programs and initiatives that build an inclusive green economy, while leveraging and aligning existing public resources, and private sources of capital and finance, toward these same goals.

We commit to join together as a movement of local governments across the United States to seize the economic, environmental and social opportunities offered by building an inclusive green economy of high quality jobs and a thriving green-collar workforce.

Let's do it now—together. **There is no time to waste.**



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## LOCAL GOVERNMENT GREEN JOBS PLEDGE BUILDING A GREEN ECONOMY FROM THE BOTTOM UP

Something remarkable is happening in communities across America. A new future is being built—one in which a strong green economy provides opportunity and security for all. Local governments are leading the charge, using green redevelopment strategies to make impressive strides in job creation that strengthens both our economy and environment. This groundswell is forging partnerships with community groups, nonprofit organizations, climate change experts, businesses, unions and schools to rebuild our country, one community at a time. Our green future will be invented at the local level and crafted by visionary public officials who are taking action to provide new models for states and the federal government. The first step towards building this green economy from the bottom up is to sign the Local Government Green Jobs Pledge to promote economic development that creates good jobs, restores communities, and improves our environment. It's not too late to secure a just, healthy, and sustainable future. Please sign the attached pledge and return it to the address listed below so that your commitment can be recorded and acknowledged. As non-partisan, non-profit organizations working to create good jobs while creating vibrant, livable communities, we are proud to support this effort and champion your leadership. Thank you for joining this growing movement and taking action on green jobs!

*– The Apollo Alliance, the Center for American Progress, Green for All, and ICLEI-Local Governments for Sustainability.*

### 5 STEP PROCESS: Creating green-collar jobs through local government initiatives

#### 1: Commit to Action

The first step is to affirm your community's commitment to green-collar jobs. This will build public will and raise the visibility of this crucial issue. To accomplish this, sign the Local Government Green Jobs Pledge and pass a County or City Council resolution detailing the next steps for implementation.

#### 2: Create a Green-collar Jobs Taskforce

A successful green-collar jobs initiative requires the expertise, political capital, and resources of a wide variety of partners. Make sure to identify key leaders in your community and consult, develop, reinvigorate or realign partnerships with potential leaders and organizations such as: community organizations, unions, businesses, workforce development programs, schools, and advocates.

#### 3: Identify Goals and Assess Opportunities

Build your successful strategies around local priorities, business conditions, and economic strengths. Ensure that overarching economic and environmental goals are integrated with job development. For example, when engaging in a comprehensive plan to reduce energy use and greenhouse gas emissions (such as ICLEI's 5 Milestone process - [www.icleiusa.org](http://www.icleiusa.org)), consider how energy conservation programs or renewable energy development will provide opportunities for local job creation.

#### 4: Create a Local Action Plan

A local action plan should address two essential areas: creating demand for green-collar jobs (job creation) and preparing a workforce to meet that demand (job training). This plan must build off of opportunities and partnerships, and align with your economic development and environmental strategies. Create demand for green-collar jobs with policies, investment, and incentives that expand the market for green products and services. Prepare a green-collar workforce by building on existing training programs that provide job seekers with "pathways out of poverty" and family-supporting, career-track jobs.

#### 5: Evaluate, Leverage and Grow

A successful local strategy for green-collar job creation must be sustained over years. To ensure the longevity of your plan: track progress and quantify your achievements, and build on partnerships and successes to enhance public support and develop new resources!

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## **LOCAL GOVERNMENT GREEN JOBS PLEDGE BUILDING A GREEN ECONOMY FROM THE BOTTOM UP**

### **What Are Green-Collar Jobs?**

Green-collar jobs address two crucial concerns facing our survival—restoring the environment and making a living. Green-collar jobs consist of work within the growing industries that are helping us kick the oil habit, curb greenhouse-gas emissions, eliminate toxins, and protect natural systems. Green-collar workers are installing solar panels, retrofitting buildings to make them more efficient, constructing transit lines, refining waste oil into biodiesel, erecting wind farms, repairing hybrid cars, building green rooftops, planting trees, and so much more. These green jobs connect a person's commitment to their work with a commitment to the planet, while building a vibrant, restorative economy. A job that does something for the planet, and little to nothing for the people or the economy, however, does not qualify.

### **Green-collar Jobs Rebuild a Strong Middle Class**

Green-collar jobs are good jobs. Green-collar jobs pay family wages and provide opportunities for advancement for a career with increasing skills and wages. Because the work of building a green economy is broadly spread across the economy, these jobs already exist in many sectors and industries—from manufacturing to construction and high skill service jobs. These jobs also provide opportunities for training and career advancement in communities across the nation.

### **Green-collar Jobs Provide Pathways Out of Poverty**

While some green jobs require advanced technical skills, most are middle-skill jobs requiring more education than high school, but less than a four-year degree. New opportunities and access to good jobs enable low-income people to take the first step toward economic self-sufficiency. These jobs are well within reach of many workers as long as they are accompanied by effective training and support programs.

### **Green-collar Jobs Strengthen Local Economies**

Much of the work to green our economy involves transforming the places that we live and work, and the way we travel. From installing solar panels to planting trees, many green jobs are difficult or impossible to outsource. In addition, these jobs build on the capacities of existing local businesses and workers, and can be increased by expanding and retooling existing training programs to meet the new demands of a green economy.

### **Green-collar Jobs Can Rebuild Both Urban and Rural Communities**

Both urban and rural America have been negatively impacted over the past decades by underinvestment in workforce development and neglected physical infrastructure. Green economic development strategies can drive reinvestment in these areas while benefiting local residents. From new transit spending and energy audits in inner cities to windmills and biomass in our nation's heartland, green jobs represent a reinvestment in America's people and communities.

Our green future will be implemented at the local level and crafted by local leaders, Please join us in making this change a reality in your community!

To find examples of draft legislation, opportunities for technical support, and more information about the five steps to creating green collar jobs, please visit: [www.greenforall.org](http://www.greenforall.org) and the report "Green-Collar Jobs in America's Cities" at: <http://www.greenforall.org/resources/green-collar-jobs-in-america2019s-cities>

**If you have any questions please reach our partnership at:**

414 13th Oakland, CA 94612  
510-663-6500 / 510-663-6510 (fax) /  
[greenjobspledge@greenforall.org](mailto:greenjobspledge@greenforall.org)

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## **F. Intergovernmental Affairs**

### **Recommendation F.7:** (approved February 8, 2010)

The CCATF recommends that Miami-Dade County develop as quickly as possible an Action Plan identifying the “who, what, when, where, and how” that will further the objectives identified in the Board of County Commissioners’ December 1, 2009 resolution in support of the Southeast Florida Regional Climate Change Compact (Compact) and related activities. Taking immediate action to further the activities highlighted in the Compact and BOCC Resolution will help elevate the importance of mitigating greenhouse gas emissions and adapting to the potential impacts of climate change in Miami-Dade County and the Region. The CCATF recommends that these actions be taken well in advance of the 2010 Climate Summit to allow for stakeholder participation and regional discussion.

The CCATF recommends that a shared regional strategy and plan to mitigate and adapt to climate change and its potential impacts include, but not be limited to:

1. Common measures of success and benchmarks;
2. Acknowledgement of the need to create uniform standards and regulations to minimize confusion and business costs associated with conducting business in different parts of the region and to encourage business activity and competition; and
3. A comprehensive outreach strategy that will engage the wide range of stakeholders, acknowledge differing views, and work to reach consensus on a shared course of action moving into the future.

**Rationale:** *The Regional Climate Compact signed on December 1, 2009 includes in part:*

**Section 5.** *Miami-Dade County shall commit appropriate staff resources and expertise, within budget constraints, to participate in a Regional Climate Team with the other aforementioned counties toward the development of a Southeast Florida Regional Climate Change Action Plan.*

**Section 6.** *Miami-Dade County shall work with the other aforementioned counties in developing a Southeast Florida Regional Climate Change Action Plan, understanding that no county will work at cross-purposes with the other counties. The Action Plan could, at a minimum, include the following components:*

- (a) A baseline of greenhouse emissions for Southeast Florida;*
- (b) Strategies for coordinated emission reductions throughout the built environment to include the use of energy efficiency, energy conservation, and the use of demand-side renewable energy resources;*

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- (c) Strategies for coordinated emission reductions from the transportation sector to include increased reliance on public transit, emerging vehicle technologies, and advanced biofuels;*
- (d) Strategies for coordinated emission reductions resulting from changes in local and regional land use;*
- (e) Strategies for the coordinated regional preparation for and adaptation to a rapidly changing global environment based upon regional mapping of projected sea-level rise and any resulting amplification of localized impacts of tropical cyclone events. Such strategies shall incorporate climate preparation concerns for the regional economy, regional infrastructure and the built environment, social and cultural needs, and natural systems within the four aforementioned counties.*

#### **Recommendation F.8:** (approved February 8, 2010)

The CCATF recommends that the County collaborate with and encourage its regional partners in the development of uniform message on climate change as part of a regional outreach and education campaign. Such a campaign should include the use of high profile media and other appropriate outlets to raise general awareness of climate change in Southeast Florida. This regional message on climate change can be supplemented with county-specific information as needed to educate Miami-Dade County residents on the potential impacts of climate change and make the connection between mitigation, adaptation, and policy changes in the County's climate change and sustainability initiatives.

**Rationale:** *Key to the development of broad-based support for addressing climate change and its potential impacts on Southeast Florida's environment, economy, and people, is the development of a common base of information of what is known and not known about climate change and its potential impacts on Southeast Florida. Coupled with opportunities for open dialogue and the sharing of different viewpoints among key stakeholder groups, the development and communication of a uniform, regional message on climate change and its potential impacts on Southeast Florida will support many objectives, including:*

- 1. Strengthening the identity of Southeast Florida as an interconnected region with shared issues of regional importance;*
- 2. The development of a common base of information and perhaps shared understanding among key stakeholders on the issues and potential impacts related to climate change;*
- 3. The potential identification of new partners and individuals willing to contribute their time and talent to addressing the challenges and opportunities facing Southeast Florida as a result of potential climate change impacts; and*
- 4. The creation of a foundation for a regional campaign focused on mitigation and adaptation solutions that Southeast Florida's public leadership may wish to pursue in the future.*



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## **Recommendation F.9:** (approved February 8, 2010)

The Office of Sustainability, in partnership with the Miami-Dade County League of Cities, should develop a local government outreach program to raise awareness about climate change science and potential climate change impacts on Miami-Dade County and possible mitigation and adaptation strategies. Local governments should be encouraged to identify a point of contact who will serve as an agency liaison to the County in issues of climate change and sustainability.

**Rationale:** *Miami-Dade County's municipalities and municipal leaders are critical to the success of the County's climate change and sustainability efforts. A local government outreach program and the development of municipal liaisons in each city will enhance communication and collaboration and further shared county and municipal efforts in the area of mitigation, adaptation, and other sustainability initiatives.*

## **Recommendation F.10:** (approved February 8, 2010)

To enhance coordination between the County and its municipalities and make it easier to incorporate "green technologies" in both residential and commercial settings, the CCATF recommends the following:

1. To enhance understanding among code officials and design professionals of what green technologies and innovative approaches are currently allowed in the code, request that the Florida Building Code Commission consider a statewide augmentation of continuing education requirements for Engineers and Architects. This will facilitate a level of uniform application of the building codes countywide. Continuing education requirements can also be expanded to include a percentage of "green initiative" elements. This recommendation requires state legislation to increase the number of hours required and to require continuing education on a yearly basis instead of biannually.

**Rationale:** *Building codes change regularly requiring code officials and design professionals to participate in continuing education programs to stay abreast of code developments. Every year all code officials in Miami-Dade County are required to attend 16 hours of specialized code training. In contrast, the continuing education requirement for Engineers and Architects include 8 hours and 20 hours every two years, respectively. An unintended consequence of this disparity in the number of hours and the frequency of training between code officials and Design Professionals is the creation of a knowledge gap between what has been historically allowed under the code and what is currently permitted. Increased continued education requirements will help close this knowledge gap. It will hopefully result in additional implementation of green technologies, improve communication between code officials and design professionals, and reduce delays and increased expenses for both home and business owners.*



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2. Request that the Office of Code Compliance develop checklists that can be used as guidelines for Building Officials and Design Professionals to further the uniform application of codes.

**Rationale:** *Uniform application of the codes provides consistency among Building Departments and improves the experience for the Design Professional. One way to achieve uniformity is by way of checklists. Checklists that further the implementation of “green technologies” can be derived for countywide use by the Office of Code Compliance and act as guidelines for the many Building Officials within the County.*

**Recommendation F.11:** (approved February 8, 2010)

The CCATF recommends that the Board of County Commissioners encourage the convening of a regional discussion around the opportunities and challenges posed to the Region’s businesses and economy by potential climate change related impacts. Key partners in a regional discussion include, but are not limited to, the region’s economic development organizations, county economic development officials, Chambers of Commerce, key business organizations representing existing and emerging industries in Southeast Florida, Enterprise Florida, and the South Florida and Treasure Coast Regional Planning Councils.

**Rationale:** *Projected climate change impacts in Southeast Florida will affect key industry sectors that drive the Region’s economy. Anticipating and adapting to potential threats, and the identification and maximization of opportunities, related to Southeast Florida’s economy will be critical to protecting and growing Southeast Florida’s economy in the future.*

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## APPENDIX 1 Committee Mission Statements

In addition to the CCATF members, there are more than 150 individuals participating in committees, representing various County departments, local and regional universities and organizations, environmental organizations, and local businesses. Each committee meets regularly to study and discuss potential future climate change impacts and develop recommendations for consideration by the Board of County Commissioners. Subcommittees may periodically be established to focus more specifically on a certain topic or issue.

### **Steering Committee**

#### **Honorable Harvey Ruvin, Chair**

The Steering Committee meets on an as-needed basis to interface with the County, share information from their respective committees, consider recommendations from the Committees and guide the Committees on their course of action. The CCATF Steering Committee is comprised of the CCATF Committee Chairs, the Director of the Miami-Dade Office of Sustainability, the Director of the Department of Environmental Resources Management, the Deputy Director of the Water and Sewer Department and the County's Climate Change Coordinator.

### **Science Committee**

#### **Dr. Harold Wanless, Chair**

Mission: To provide the CCATF and its Committees with the best possible scientific and technical information and analysis on the possible near-term and long-term impacts of climate change on the Miami-Dade region. These impacts may include, but are not limited to: sea level rise, saltwater intrusion, fires, disease and more severe weather -- hurricanes, floods, droughts and heat waves. The information should address the efficacy and cost-benefit of strategies to mitigate these impacts through greenhouse gas emission reductions; to adapt and adaptively manage our natural systems and the built environment; and the potential economic, social and health impacts of climate change and climate change solution strategies. The Committee assists the Task Force to interpret and communicate scientific and technical information to policymakers and to the general public.

### **Natural Systems Adaptation Committee**

#### **Dan Kimball, Chair**

Mission: To provide the CCATF with recommendations for adaptation and adaptive management of natural systems to predicted climate impacts. These systems include, but are not limited to: land and marine ecosystems, natural species, beaches and parklands, water supplies, agricultural lands and other natural resource systems. The Committee will develop standards and strategies for natural system "resiliency;" prevention of adverse consequences and response and recovery from future conditions and events. The Committee identifies effective tools for natural systems adaptation goals, policies, programs, funding and measures of progress and success.

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## **Intergovernmental Affairs Committee**

### **Carolyn Dekle, Chair**

Mission: To provide the CCATF with information and analysis about the climate change strategies and actions among other governmental entities: within the broader south Florida region, among communities across the state, within state government and at the national and international level. The Committee pays special attention to opportunities for the Commission to add its voice to those of others to promote policies and programs that will help the County, state and the nation to address climate change more effectively. The Committee identifies opportunities for collaboration with other governmental entities, where such action would enhance the ability of Miami-Dade to more effectively address climate change. The Committee also seeks ways to effectively communicate the climate change issue and the recommended Advisory Task Force solutions.

## **Greenhouse Gas Reduction Committee**

### **Richard Pettigrew, Chair**

#### **Alternate Fuels and Transportation Subcommittee - Jose Fuentes, Chair**

#### **Energy and Buildings Subcommittee - Jane Gilbert, Chair**

Mission: To provide the CCATF with recommendations for effectively mitigating climate change through greenhouse gas reductions in the near-term and long-term, building on existing Miami-Dade policies and practices and drawing on the best practices from cities and regions across the United States and around the world. The Subcommittees recommend ways to foster and coordinate commitments and actions among businesses, households, individuals, communities, Miami-Dade County operations and other local governments, to reduce greenhouse gas emissions. Two subcommittees of the Greenhouse Gas Reduction Committee were formed in 2007 and meet regularly to separately handle the complex and diverse topics of transportation and the built environment.

## **Economic, Social and Health Adaptation Committee**

### **Captain Dan Kipnis, Chair**

Mission: To provide the CCATF with analysis and recommendations regarding the economic, social and health impacts of climate change. The Committee focuses on the most important economic sectors of the Miami-Dade region: tourism, development, trade, agriculture, insurance and others. The Committee develops recommendations to minimize and ameliorate the possible negative impacts of climate change, taking into account the economic, social and health interests of the businesses and people of Miami-Dade County. In particular, the Committee recommends ways to avoid disparities in the impact upon low-income, fixed-income or other potentially disadvantaged people and communities. In addition, the Committee seeks to identify climate change solutions, particularly in the realm of adaptation, that may offer Miami-Dade businesses, workers, financial institutions and investors, universities, and other entities with an economic interest in this issue with an opportunity to develop and market products and services for the rest of the country and the world, and thereby represent an economic opportunity for the region. The Committee provides the Task Force with recommendations to promote that opportunity through education and outreach.

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## **Built Environment Adaptation Committee**

### **Elizabeth Plater-Zyberk, Chair**

Mission: To provide the CCATF with recommendations for adapting and adaptive management of the existing and future "built environment" in an effort to react to and mitigate predicted climate impacts. This includes, but is not limited to, all forms of public and private property: homes, office buildings, industrial and commercial facilities, and infrastructure and modifications of infrastructure systems -- roads, rail, ports and airports, bridges, waterways and public works. The Committee recommends standards and strategies for property and infrastructure systems "resiliency," which is the prevention of adverse consequences, and response and recovery from future conditions and events. The Committee identifies effective tools for property and infrastructure adaptation such as goals, policies, programs, funding and measures of progress and success.

**APPENDIX II - CLIMATE CHANGE ADVISORY TASK FORCE ANNUAL REPORT 2010**  
**STATUS OF INITIAL APRIL 2008 RECOMMENDATIONS.**

Rec#	Recommendation	Status / Implementation Plan	Related Rec#s
<b>Science Recommendations</b>			
A1	The County should use the Science Committee's Statement on Sea Level in the Coming Century to guide future climate change mitigation and adaptation policy.	The CCATF Committees have considered the Science statement in their deliberations since 2007. The Statement has become accepted as mainstream and is cited in many reports and meetings outside of the CCATF. The County will now partner through the regional Climate Compact for a collaborative regional climate statement.	A2
A2	The County should commission detailed maps for all of Miami-Dade County created from calibrated LIDAR (Light Detection and Ranging) surveys (or other elevation survey technology that employs best known practices). The maps will allow identification of which areas will become flooded in association with different sea levels.	In 2008 and 2009, the Department of Environmental Resources Management (DERM) drafted and then updated a Digital Elevation Model (DEM) using three 2003 LIDAR data sources: CSOP-USACOE, IHRC-FIU, and Woolpert-ETSD. These were the most up to date and accurate LIDAR sources available at the time.  The County is partnering with the U.S. Geological Survey (USGS) to develop a modeling program for surface and groundwater flows. This will help the County in its climate change adaptation planning process. OOS and NOAA are partnering to explore a regional approach to mapping	A1
<b>GHG Recommendations</b>			
B1	Ordinances related to the award/allocation of taxicab medallions include a requirement for all new medallions issued after January 1, 2008 to be allocated to hybrid or other vehicles having a combined average fuel efficiency of 28 MPG or higher	Commissioner Barreiro sponsored Ordinance in July '08 to phase in more fuel efficient vehicles as part of the annual replacement schedule. Following several meetings and taxicab workshops, this item was deferred in November '08 and has not yet been advanced.	B2, B4
B2	Require that taxicabs being retired be replaced with new hybrid or other vehicles having a combined average fuel efficiency of 28 MPG or higher. Implementation of this recommendation is expected to affect 300 owners each year. The County should develop a financing mechanism to either subsidize the initial purchases or provide a revolving loan fund to assist owners to purchase new hybrids on reasonable terms and at reasonable interest rates.	The County has investigated a revolving fund, but has not finalized an action.	B4



APPENDIX II - CLIMATE CHANGE ADVISORY TASK FORCE ANNUAL REPORT 2010  
STATUS OF INITIAL APRIL 2008 RECOMMENDATIONS.

Rec#	Recommendation	Status / Implementation Plan	Related Rec#s
<b>GHG Recommendations</b>			
B3	It is recommended that Miami-Dade County regularly evaluate greenhouse gas emission reductions and the net environmental benefit of each fuel and vehicle under consideration for purchase and use in internal operations in order to ensure the use of the most efficient vehicles and sustainably-sourced alternative fuels, including those that are locally produced, and adjust investment accordingly. Net environmental benefit shall be determined.	No action has been taken. The recommendation may require a County Commission action. the Department of Solid Waste Management has purchased 6 hybrid garbage trucks. Smaller departments may find the implementation more difficult.	B4
B4	Procurement Management Department should take necessary steps to improve pricing and access to sustainably-sourced alternative fuels and high efficiency vehicles for County operations. This would include forming a joint committee or committees to pursue collective purchasing opportunities and to evaluate the costs and benefits of collective bids.	The County is negotiating its fuel contract, which contains provisions for alternative fuel sources. Efforts are underway to reduce the number of fuel vendors to one. To avoid interruptions in the dispensing of fuel in the event of hurricanes and other major emergencies, the County is attempting to purchase fuel from Port Everglades. The County is trying to negotiate for competitive pricing by including municipalities. The Department of Procurement Management is working with the U.S. Communities, a national purchasing cooperative, on other commodities and that fuel can potentially be purchased the same way, in lieu of creating another committee.	B3
B5	The Climate Change Advisory Task Force recommends that as Miami-Dade County fueling facilities are built, modified, or upgraded, they be designed and constructed to accommodate alternative fuels, including, but not limited to, E85 and B100. In addition, the County should consider dispensing E85 at two Miami-Dade County fueling stations within 6 months of it becoming locally available as determined by the process described in Recommendation B.3. It is recommended that Miami-Dade re-evaluate the use of E85 six months after dispensing is initiated to assess local availability, overall net costs and environmental impacts. Furthermore, new vehicles being purchased now and in the future by Miami-Dade County should have the capability of using ethanol and biodiesel, without the need for retrofit.	The General Services Administration (GSA) had been converting its single wall tanks to double wall tanks to comply with the Environmental Protection Agency's (EPA's) requirements for storing alternative fuels. GSA is aware of Recommendation B.5, which did not necessarily require County Commission action. Regarding a County Manager memorandum indicating that by April 2009, the County should be using B20 diesel fuel, the County is currently buying E10 and B5 fuels. GSA has determined that using E85 is not economically feasible.	

**APPENDIX II - CLIMATE CHANGE ADVISORY TASK FORCE ANNUAL REPORT 2010  
STATUS OF INITIAL APRIL 2008 RECOMMENDATIONS.**

Rec#	Recommendation	Status / Implementation Plan	Related Rec#s
<b>GHG Recommendations</b>			
B6	Require the use of sustainably-sourced biodiesel in all County diesel fleet vehicles and equipment (except standby equipment) as determined by the process described in Recommendation B.3, starting with B5 and increasing to B20 in 6 months. The Climate Change Advisory Task Force recommends that a portion of the local option gasoline tax be used to offset the cost difference for biodiesel.	This recommendation will require County Commission action, since this would require a policy shift. LOGT dollars are currently committed to other efforts for the most part.	
B7	Require that Miami-Dade County develop a vehicle procurement process, which ensures that vehicles owned by MDC increase their mpg by 5% annually per vehicle class (whenever higher MPG vehicles are available) and that the cost of carbon emissions is included in the life cycle cost analysis process.	No action has been taken to date.	
B8	The purchase of a hybrid SUV shall be an allowable alternative for Miami-Dade County fleet procurement if that vehicle is determined to be more fuel-efficient than a light truck or other comparable vehicle.	This recommendation will require County Commission action. The recommendation was made to ensure that the County only purchase heavy vehicles when they were really needed.	
B9	Direct the Office of Sustainability to initiate an energy and fuel conservation incentive and awareness campaign for employees. Department. This campaign should use information from the Chicago Climate Exchange membership, the Climate Change Advisory Task Force (CCATF) Science Committee, and other pertinent sources to conservation incentive and awareness campaign for employees in conjunction with the Miami-Dade County's Resource Conservation Committee, DERM's Pollution Prevention and Environmental Education work groups, and GSA.	The County received an Energy Efficiency and Conservation Block Grant (EECBG) and was using that block grant to develop an energy efficiency public outreach informational campaign in accordance with this recommendation. All County departments are now required to incorporate sustainability efforts into their business plans, and that all department directors' goals and objectives had incorporated sustainability initiatives as well. Employee pledge/challenge cards will be ready for distribution to employees in January 2010, and that every director would be held responsible for obtaining employees' pledges.	
B10	The Climate Change Advisory Task Force supports any recommendations put forth as a result of the most recent Miami-Dade County fleet analysis that lead to an increase in fleet fuel efficiency and a reduction in vehicle miles traveled (VMT). The Task Force recommends that the County further strengthen these recommendations by creating incentives to reduce VMT and by not excluding any departments or vehicle types in reduction initiatives. As an example, it is recommended that hybrid sedans be purchased for non-pursuit police vehicles at the time of replacement.	The County is addressing this recommendation on an ongoing basis. The current year's budget contains a 2% reduction of the County's light fleet. The County is having difficulty purchasing hybrid sedans for non-pursuit police vehicles. She pointed out that the County Manager is encouraging fleet reduction and teleconferencing.	



APPENDIX II - CLIMATE CHANGE ADVISORY TASK FORCE ANNUAL REPORT 2010  
STATUS OF INITIAL APRIL 2008 RECOMMENDATIONS.

Rec#	Recommendation	Built Environment / Adaptation	Status / Implementation Plan	Related Rec#s
C1	Require all County agencies (and entities that receive County funding for significant infrastructure or built investments) to assess climate change impacts on the agency's/entity's responsibilities. This assessment should be incorporated into their master planning agenda or such a planning process should be initiated if it does not exist. The assessment should include the impact of sea level rise on all public investments and identification of vulnerabilities in order to produce strategies for mitigation and adaptation. These assessments should utilize a 50-year planning horizon.		The County Manager & Office of Sustainability Manager met with department directors in fall 2008, and directed them to begin incorporating climate change planning into their strategic plans. The County Manager announced that the County would be developing and implementing a formal Sustainability Plan in the coming year. The County Administration is beginning to address this recommendation on public investments, which is a GreenPrint initiative, and it will require administrative and legislative action. Ms. Torriente noted she would ask County Attorney Robert Cuevas to assign an Assistant County Attorney to work on this.	
C2	Use County charter authority to establish minimum criteria and standards related to climate change (including sea level rise), for public investment for all municipalities in Miami-Dade County.	This recommendation requires legislative action by the County Commission as well as input from affected municipalities. County staff have been seeking input from municipalities on GreenPrint, but can also reach out to them through the League of Cities.		
C3	Expand the mission of the County's Office of Sustainability (OOS), and thus its resources and staffing, to provide a centralized agency for climate change information, monitoring, analysis, and benchmarking. (Note: also see Recommendation F.4) a.) Establish a base case of information at an identified current or recent past date, to which all ensuing data might be compared; b.) Assist in integrating the activities of the various entities including the coordination of data collection so that it can be used across departments/disciplines for analysis and comparison; and determine the appropriate metrics for critical issues; c.) Monitor the effects of climate change on Miami-Dade County using the evolving data base, and publish the results for use by elected leaders, public agencies, and the general public.	The Office of Sustainability responsibilities were expanded to oversee the use of a \$12 million Energy Efficiency and Conservation Block Grant (EECBG). Still, the recommendation will require additional funding and legislative action by the County Commission. The EECBG is only for energy and energy efficiency. OOS constantly monitors grants and it will look for those that addressed benchmarking. The EECBG funding allocations to 14 projects were set, although they may be amendable later. a. No action has been taken to date. b. Miami-Dade County was recently chosen (February 2009) by ICLEI (International Council on Local Environmental Initiatives) and New York City, as one of three local governments nationwide to receive technical assistance in developing a sustainability plan and Toolkit for the County and other local governments to utilize. c. No action has been taken to date.		

APPENDIX II - CLIMATE CHANGE ADVISORY TASK FORCE ANNUAL REPORT 2010  
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Rec#	Recommendation	Status / Implementation Plan	Related Rec#s
Natural Systems Adaptation			
D1	Fully support the Comprehensive Everglades Restoration Plan (CERP), and increase funding and resources for other regional and local habitat restoration and preservation efforts and initiatives.	The County is supporting portions of this very broad recommendation, which will be in GreenPrint as an initiative.	
D2	Increase funding and resources for land acquisition and management programs of Miami-Dade County. Investigate new and creative mechanisms to boost funding, such as the creation of a County-administered "carbon credit purchasing" program, as a potential alternative to current development, industry, and government mitigation requirements.	The County Commission would have to create and approve such a program, OOS will meet with DERM staff to consider ways to fund DERM's Environmentally Endangered Lands (EEL) program and ways to offset the costs of the EEL program.	
D3	Acquire all undeveloped lands needed for restoration purposes and for mitigation and adaptation to climate change effects. Secure strategic open lands to provide transition zones to accommodate retreat or spatial shifts in natural areas, such as coastal wetlands and freshwater marshes.	OOS and DERM will consider and report on this recommendation in terms of offsetting costs or funding options.	
D4	Create a plan to locate infrastructure and development outside coastal or flood hazard prone areas using projections of sea level rise to identify those areas. Describe a transitional zone between the hazard area and the built area to be protected and prohibit incompatible land uses that would convert open lands in the transitional zone. Establish a comprehensive planning and zoning policy, such as development setbacks and limits on density and infrastructure in coastal and transitional zones to consider vulnerability to sea level rise and saltwater intrusion. ( <i>Note: see also Recommendations C.2. and E.1</i> )	No action has been taken to date.	
D5	Encourage the continued funding of the County Agriculture Purchase of Development Rights Program beyond the current funding levels to maintain open lands for aquifer recharge, habitat, and buffers.	The County funded the PDR program with \$30 million by the General Obligation Bond. In 2008, Mr. Charles LaPradd, the County's Agricultural Manager, acquired federal grants that matched local dollars 50%. The County will continue the aforementioned funding efforts and will note them in GreenPrint.	
D6	Provide incentives to study and develop best practices for agricultural management that contribute to carbon sequestration and reduce greenhouse gas emissions.	DERM and Mr. LaPradd acquired a grant this year from the Environmental Protection Agency (EPA), funded with American Recovery and Reinvestment Act dollars, which the County used to provide money to farmers to replace old irrigation pump engines with more energy efficient engines. County staff will seek for additional grants.	



**APPENDIX II - CLIMATE CHANGE ADVISORY TASK FORCE ANNUAL REPORT 2010  
STATUS OF INITIAL APRIL 2008 RECOMMENDATIONS.**

Rec#	Recommendation	Status / Implementation Plan	Related Rec#s
<b>Natural Systems Adaptation</b>			
D7	Increase funding for County-administered management activities like those programs within Natural Areas Management and Environmentally Endangered Lands. Establish a multi-agency task force to expand County capacity and coordinate conservation activities. Develop a collaborative and integrated approach to conservation involving universities, government agencies, landowners, botanic gardens, zoos, and non-governmental organizations. (Note: see also Recommendation F.2)	The County is doing a lot of work on this as part of the process for developing the GreenPrint assessment section. Mr. Carlos Espinosa, Director, DERM, noted that eliminating unnecessary drainage and limiting saltwater intrusion was part of the critical path of issues in South Dade. The SFWMD is aware of the over drainage problem of existing canals for agriculture and insufficient drainage of urban areas	
D8	Review current stormwater management operations, including the operation of canals and structures, in order to eliminate unnecessary over-drainage and limit the extent of saltwater intrusion into ground and surface water resources. Additionally, require water conservation measures for all users of the Biscayne Aquifer. (Note: see also Recommendations D.2 and D.3)	This recommendation requires legislative action, as well as budget action for the first and second parts.	
D9	Develop a "Vital Signs" monitoring program, following the model of the National Park Service, to serve as a multi-parameter ecosystem monitoring program that will help track climate change effects. Expand current ongoing monitoring efforts, such as those within the Comprehensive Everglades Restoration Plan (CERP), to include specific areas of Miami-Dade County, to provide a better view of how natural areas are changing over time and what forces are responsible. Dedicate a source of funds to collect information and establish and maintain a long-term data management system.	No action has been taken. However, OOS recognizes that this will need to be a Greenprint initiative. Ms. Torriente noted she would meet with Mr. Espinosa and Mr. Doug Yoder to follow up on the idea of holding a workshop.	
D10	Miami-Dade County should establish partnerships, both formal and informal, with other governmental entities, including local, State, and Federal governments; the private sector; non-governmental organizations; and other stakeholders in the County. Partnerships should focus on cooperative efforts to restore existing natural ecosystems; protect natural and open lands; mitigate impacts; and monitor natural systems and indicators of climate change. Partnerships should also be undertaken to effectively practice adaptive management as we increase our understanding over time of the effects of climate change on natural systems in the County and implement management actions to restore and protect natural systems in the County. (Note: see also Recommendations D.3, D.8,	This recommendation is ongoing, administrative, and legislative.	



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Rec#	Recommendation	Status / Implementation Plan	Related Rec#s
<b>Economic, Social and Health Adaptation</b>			
E1	The Task Force recommends that the Miami-Dade County Comprehensive Development Master Plan (CDMP) be revised to include a new policy to restrict land uses in areas that would be at risk from sea level rise and associated impacts within the next 50 years as per the CCATF Science Committee's Statement on Sea Level in the Coming Century report and projections. A continuous 50-year planning horizon should be used. (Note: see also Recommendations C.2 and D.4)	No action has been taken to date.	
E2	Initiate an additional long-term CCATF advisory board committee composed of representatives from federal, state, and local environmental agencies (including Miami-Dade County DERM, WASD, Cooperative Extension), the Miami-Dade County Department of Health, local colleges and universities, and community leaders to address potential human infectious disease changes and increases that may accompany climate change and to make technical and funding recommendations to the Miami-Dade County Board of County Commissioners.	This recommendation will require County Commission action. Mayor Alvarez's Sustainability Advisory Board is focused on helping OOS develop GreenPrint. Once GreenPrint is completed, the Mayor's board will also sunset in approximately a year. At that point, the County may want to create a group to act as an implementing partner or facilitator.	
E3	The County shall form an interdisciplinary, community-wide working group, including the media and institutions of higher education, which (a) focuses on public education and information regarding climate change and adaptation and (b) assesses public opinion regarding these subjects.	No action has been taken to date.	
E4	The Task Force recommends that the County bring together all agencies and entities involved in economic development and planning in order to develop a unified and comprehensive response to the challenges of climate change, housing, economic development, and quality of life.	This recommendation will require County Commission action. No action has been taken to date.	

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Rec#	Recommendation	Status / Implementation Plan	Related Rec#s
<b>Intergovernmental Affairs</b>			
F1	Conduct a survey of Miami-Dade County municipalities to gauge their level of knowledge and engagement in climate change issues, learn about their activities, and begin the creation of an intergovernmental, learning network that allows members to work with each other and the County on adaptation / mitigation issues. Once the survey has been completed, engage the cities in a dialogue about the survey findings and work of the Climate Change Advisory Task Force. This dialogue could happen in a number of ways including a meeting with the Miami-Dade League of Cities and/or a convening of Miami-Dade	A survey was completed by the South Florida Regional Planning Council and the League of Cities. The final report was published December 2009.	
F2	Convene local and state agencies and water and sewer utilities around a discussion of climate change and impacts on water quantity, quality, and availability and implications for infrastructure planning and investment. <b>(Note: see also Recommendations D.7, D.10, and F.3)</b>	The regional Climate Leadership Summit set the stage to address this recommendation.	
F3	Convene a broader group of local and state agencies around a discussion of their activities related to climate change. Agencies / groups would include, but not be limited to, DOT 4 & 6, DEP, SFWMD, DCA, Health Planning Agencies, Ecosystem Restoration Task Force, etc. In this conversation we will gain a better understanding if there are issues or concerns that we need to be aware of and identify opportunities for collaboration moving forward. (Note: see also Recommendations D.10, and F.2)	The County is addressing this recommendation through their meetings with NOAA's Digital Coast Initiative and Dade County case study.	
F4	Develop a County internet website with up-to-date information about the work of the Miami-Dade Board of County Commissioners, the CCATF, and municipalities with links to information and best practices related to climate change, adaptation and mitigation efforts by individuals and organizations. (Note: see also Recommendations C.3 and E.3)	STATUS: Web sites has been established for CCATF and Greenprint: <a href="http://www.miamidade.gov/derm/climatechange/taskforce.asp">http://www.miamidade.gov/derm/climatechange/taskforce.asp</a> <a href="http://www.miamidade.gov/GreenPrint/">http://www.miamidade.gov/GreenPrint/</a>	

APPENDIX II - CLIMATE CHANGE ADVISORY TASK FORCE ANNUAL REPORT 2010  
STATUS OF INITIAL APRIL 2008 RECOMMENDATIONS.

Rec#	Recommendation	Status / Implementation Plan	Related Rec#s
<b>Intergovernmental Affairs</b>			
F5	Work with the region's children's museums and foundations to create and fund educational exhibits on climate change, green technologies, clean cities, etc. (Note: see also Recommendation E.3)	The Office of Sustainability has started discussing this recommendation with the Museum of Science and Mr. Michael Spring, Director, Department of Cultural Affairs. Conversations have not been held with the Miami Children's Museum. .	
F6	Identify and develop educational materials that can be incorporated into a Miami-Dade Public Schools curriculum on climate change, the environment, and sustainability. The materials should be shared with other educational institutions to facilitate the dissemination of information to Miami-Dade residents. (Note: see also Recommendations C.3 and E.3)	Miami-Dade County Public Schools created a sustainability office. The Office of Sustainability has discussed this recommendation with the staff in this office.	

## Appendix III

### Miami-Dade Climate Change Advisory Task Force

#### STATEMENT ON SEA LEVEL IN THE COMING CENTURY

Science and Technology Committee

January 17, 2008

Significant sea level rise is a very real threat to the near future for Miami-Dade County.

**BACKGROUND:** Over the past 2,500 years south Florida has experienced an average rate of relative sea level rise<sup>1</sup> of about 1.5 inches per century<sup>a</sup>. Over this time our sandy, mangrove and muddy coastlines were mostly stable or expanding seawards. The broad coastal wetlands and historically stable sandy coastlines of south Florida are a product of this prolonged period of very gradual sea level rise.

Since 1932, south Florida has had about a 9 inch relative rise of sea level<sup>b</sup>. This is a rate of one foot per century and is about 8 times the average rate over the past 2,500 years. Much of this accelerated rise is the result of warming (and expansion) of water in the western North Atlantic Ocean in response to global warming<sup>c</sup>. Our coastal and shallow marine environments are now evolving in response to the stresses of this rising sea level.

**EVALUATION:** The 2001 report of the United Nations sponsored Intergovernmental Panel on Climate Change (IPCC) projected an additional sea level rise over the coming century of 1-3 feet (median level rise of 2 feet.). The 2007 IPCC report projected a somewhat lower level, but it did not incorporate the significantly accelerated melting being observed in the Greenland Ice Sheet (apparently because the results had not yet been published in peer-reviewed science journals)<sup>d</sup>. As a result, the IPCC report, which should be the guidance for the future, underestimates the amount of sea level rise that is likely to occur in this century<sup>e</sup>.

Since 2000, rapid changes have been occurring to the Greenland Ice Sheet - changes that were projected to begin at the end of this century<sup>f</sup>. Over this past decade, there has also been rapid loss of multiyear pack ice in the Arctic Ocean, a phenomenon not projected to occur until 2070. Simply put, climate and glacial scientists now see that models failed to predict the rapidity and quickness with which these critical changes would occur.<sup>g</sup> Both the Arctic Ocean and Greenland Ice Sheet have important 'positive feedback' effects that are driving these accelerated changes. Positive feedbacks are secondary effects that further reinforce and accelerate the primary changes. For the Greenland Ice Sheet, (a) summer melt water on the lower elevation margins of the ice sheet is forming surface pools on the ice which absorb incoming solar energy, thus accelerating melting; (b) the melted surface water is flushing down to the bottom through fractures and dissolved moulins (vertical holes) in the ice sheet, forming a lubricated layer over the rock which is dramatically accelerating the rate of the ice sheet breakup and movement towards the sea<sup>h</sup>; and (c) as the ice sheet margins melt and move towards the sea, the elevations on the ice sheet are lowering, placing the surface in yet warmer conditions.<sup>i</sup>

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<sup>1</sup> Relative sea level rise for an area is a combination of the change in ocean level and local changes in response to uplift or subsidence of the land. For example, North Carolina has a greater relative sea level rise than south Florida because the land there is subsiding faster.

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### Miami-Dade Climate Change Advisory Task Force

Melt effects are expanding northwards on both coasts of Greenland. Even the very northern portions of Greenland have seen increased melting over the past decade.<sup>j</sup> Field observations from this summer in western Greenland have documented amazing acceleration of marginal glaciers. The Illulissat Icefjord, located 150 miles north of the Arctic Circle, is an outlet for about 7% of the Greenland Sheet. This marginal glacier had been receding in response to increased marginal glacier melt. Beginning in 2002, the ice has surged seaward and is presently moving seaward at over 9 miles per year with additional pulses as high as 3.1 miles in 90 minutes! Melt waters seeping down through the ice sheet have created a 1,600 foot thick layer of water on which the interior ice sheet is now floating, fracturing, and surging to the sea. Acceleration of melting of the Greenland ice sheet is the critical factor to the rise of global sea level in the coming century.<sup>k</sup>

The Arctic Ocean has historically been sufficiently blocked with thick floating pack ice that navigation through the 'Northwest Passage' has remained elusive until recently. The pack ice is floating on the water of the Arctic Ocean and its melting would not in itself change sea level (like a melting ice cube in your glass). However, the white pack ice surface reflects nearly all incoming solar energy back into the air and space. Melting of the pack ice leaves areas of open water which absorb nearly 90 percent of the incoming solar energy. This warms the water, which further accelerates the rate of melting in the Arctic summer and reduces cooling in winter. Historically, the pack ice covering much of the Arctic Ocean through the summer was made of large solid masses of ice that were 4-5 years old, thickening each year. In the past decade, the pack ice has become increasingly younger and thinner. Most of the pack ice this summer is only 1-2 years old. It is thin, highly fragmented and contains many open water areas. As of mid September, this year's summer melt has left 30% less pack ice than the previous record low (in 2005).<sup>l</sup> The large open water areas were 9 degrees Fahrenheit warmer than normal. Melting will continue until at least mid September. The pack ice is now so thin and fragmented that it could potentially float out of the Arctic into the Atlantic. Climate projections had talked of the possibility of a summer ice-free Arctic Ocean in 40-80 years. Now it looks like that may happen within a decade if recent trends continue.<sup>m</sup> As the pack ice diminishes over the Arctic Ocean, the adjacent land will warm, vast areas of tundra permafrost will melt releasing potentially catastrophic amounts of methane to the atmosphere<sup>2</sup>, and melting of the Greenland Ice Sheet will even further accelerate. In short, the recent changes occurring in the Arctic and Greenland mean that global warming and sea level rise will happen much more rapidly than had been only recently projected. Even recent model projections of future ice melt for Greenland by 2040 have already happened in 2007.<sup>n</sup>

In the Antarctic, there is no inherent reason why the impacts of warming should follow the pattern of the Arctic Ocean. The Arctic is an ocean surrounded by land, whereas the Antarctic is a continent surrounded by ocean. Nevertheless, there has been a gradual loss

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<sup>2</sup> Methane is another greenhouse gas. One molecule of methane captures 20 times the heat of a molecule of carbon dioxide. In the atmosphere, methane eventually will oxidize to carbon dioxide and water. This takes about 10 years.



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past decade (as anticipated by climate models); about a 12% increase in the flow rate of 300 glaciers around the margin of Antarctica between 1993 and 2003<sup>3</sup>; and a significant increase in summer snow melt in both marginal and interior areas of the ice sheet since 2005. Antarctica is a critical unknown to future projections; however, it is showing distinctive early signatures of accelerated ice release.<sup>p</sup>

**PROJECTION:** A further 2-foot sea level rise by the end of the century, as projected in the 2001 IPCC report, would make life in south Florida very difficult for everyone. Spring high tides would be +4.5 to 5 feet above present mean sea level<sup>3</sup> q; storm surges would be higher; barrier islands, fill islands and low-lying mainland areas would be frequently flooded; salt water intrusion would restrict available freshwater resources; drainage would be more sluggish; Turkey Point would be an offshore island; and so on. Unfortunately, it looks as though sea level in the coming century will rise significantly more than two feet. With what is happening in the Arctic and Greenland, many respected scientists<sup>4</sup> now see a likely sea level rise of **at least** 1.5 feet in the coming 50 years and a total of **at least** 3-5 feet by the end of the century, possibly significantly more (calculations used are provided at end of statement). Spring high tides would be at +6 to +8 feet<sup>r</sup>. This does not take into account the possibility of a catastrophically rapid melt of land-bound ice from Greenland, and it makes no assumptions about Antarctica. The projected rises will just be the beginning of further significant releases from Greenland and possibly Antarctica. Hopefully, the IPCC will quickly revisit the question of sea level rise and provide a more valid and meaningful projection; however, to date, that is not planned until about 2012. When they revisit the current estimates, we expect it will be at least in the 3-5 foot range for this century.<sup>s</sup> Developed Miami-Dade County as we know it will significantly change with a 3-4 foot sea level rise. Spring high tides would be at about + 6 to 7 feet; freshwater resources

<sup>3</sup> Elevations are relative to a zero, which is 'mean lower low water' (spring low tide) when originally established in the late 1920s. Some topographic maps use MLLW and some correct to mean sea level (MSL) which is about 1.5 feet higher. With the 0.8 foot relative sea level rise since about 1930, today's mean higher high water (MHHW) is +2.3 feet above 1929 MSL (3.8 feet above MLLW), exceptional tides may reach over +3.3 feet (4.8 feet above MLLW), and storm tides and surges are added on to that. For considering future sea level rise, add 2.3 feet to the projected increase for MHHW (average spring high tide). See also endnote 'q'.

<sup>4</sup> For example: Dr. Robert Corell, a key contributor to the IPCC and chair of the Arctic Climate Impact Assessment, said this September that there is a consensus that new data collected since the IPCC report (i.e., the last two years) shows a 'massive acceleration' in the loss of ice mass in Greenland, and the consequences are outstripping the capacity of scientific models to predict it. Dr. James Hansen, director of NASA's Goddard Institute for Space Studies, suggests that sea level could rise by one to several meters (1 meter = 3.25 feet) by the end of the century.

<sup>5</sup> Total melting of the Greenland ice sheet would add about 23 feet to global sea level. In Antarctica, the collapse of the West Antarctic Ice Sheet would result in another 20 feet. With the warming we have caused and will cause from greenhouse gas buildup, melting of both of these is a distinct possibility in the future. During the previous interglacial period 130,000 to 120,000 years ago, sea level was about 25 feet higher than present.

Were the ice on Antarctica to totally melt, sea level would rise over 200 feet, but that seems unlikely.

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would be gone; the Everglades would be inundated on the west side of Miami-Dade County; the barrier islands would be largely inundated; storm surges would be devastating; landfill sites would be exposed to erosion contaminating marine and coastal environments. Freshwater and coastal mangrove wetlands will not keep up with or offset sea level rises of two feet per century or greater. With a five foot rise (spring tides at nearly +8 feet), Miami-Dade County will be extremely diminished.

**REALITY FOR OUR FUTURE:** Miami-Dade County, like all other coastal and lowlying counties, is now facing much more challenging decisions than ever imagined. We will work to provide more carefully documented projections, but we hope you see the urgency of reconsidering nearly every aspect of the county's management, zoning, infrastructure, and planning.

One urgent effort is to look at what Miami-Dade County will need to do to remain inhabitable and functional at benchmarks of a further 1, 2, 3, 4 and 5 foot rise in sea level – and at what point portions of the county will need to yield to the rising sea. This will require a detailed documentation of the elevations of infrastructure elements and roadways; susceptibility of coastal, wetland and artificial fill areas to erosion; defining areas of potential pollution and contamination release; determining changing drainage and storm surge risks; assessing structural viability of buildings and levees with changing groundwater levels and saline water intrusion; looking at the future of fresh potable water sources; defining the modifications necessary to maintain connectivity of roadways; and many other aspects. It should be pointed out that the highly porous limestone and sand substrate of Miami- Dade County (which at present permits excellent drainage) will limit the effectiveness of widespread use of levees and dikes to wall off the encroaching sea.

Respectfully submitted,

Science and Technology Committee

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Dr. Stephen Leatherman Florida International Univ., sedimentology/coastal processes  
Committee Members

Dr. John R. Bethea Community Consultant, conflict resolution and public policy

Dr. Adriana Cantillo, Scientist, chemistry

Ms. Diana Cornley Miami-Dade County, coastal ecosystem restoration

Dr. Will Drennan University of Miami, ocean-atmosphere interaction

Dr. David Enfield Scientist, climate variability

Mr. Peter Harlem Florida International Univ., sedimentologist, wetlands ecologist

Dr. James S. Klaus University of Miami, coral reef paleoecologist

Mr. Orestes Lavassas South Florida Biodiesel, renewable energy

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Dr. Georgio Tachiev Florida international University, hydrology, water resources

Dr. John Van Leer University of Miami, physical oceanography

Mr. Doug Yoder Miami- Dade County

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<sup>6</sup> All members of the committee have worked together to develop this statement, and all have signed on.

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#### ASSESSMENT OF MINIMAL SEA LEVEL RISE IN THIS CENTURY

*IPCC 2007 numbers and explanations in italics; this study's numbers and explanations in regular type.*

##### **Thermal expansion of oceans**

*IPCC has expansion at over half of their projection for coming century*

= 8 inches = 20 cm

But since they assumed a much lower rate of Arctic ice loss and subsequent warming than is happening, this should be at least half again as much

= 30 cm

##### **Non-ice sheet glacial melt**

=10-25 cm per century in coming century.

##### **Greenland melt**

*Greenland dramatically increased its melting at the beginning of this century. IPCC comments on this but does not include a significant contribution in coming century.*

Presently 150-250 km<sup>3</sup> ice per year = a 1 mm thick layer 150,000,000-250,000,000 km<sup>2</sup> extent  
Area of oceans ≈ 361,000,000 km<sup>2</sup>. So presently Greenland melt is providing a 0.4-0.7 mm/year contribution to sea level rise (= 4-7 cm / century and is rapidly increasing).

As present melt is just starting (mostly since 2000) and mostly restricted to the southern portions, one can project that this will increase at least by a factor of 12. This is justified by the rapid warming of the adjacent ocean waters and accelerated melting of Arctic summer pack ice, which will lead to further acceleration of Greenland ice sheet melt.

Minimal contribution this century should be 48-84 cm. There is the possibility that this could approach 200 cm. by the end of the century but probably not more (Pfeffer, 2007).

##### **Antarctica**

*IPCC 2007 says historical rises were 1961-2003 = 0.14 mm/yr = 1.4 cm/100 yrs*

*1993-2003 = 0.21 mm/yr = 2.1 cm/century*

Current rate has increased to ~5 cm/century.

Antarctica has sort of been ignored even though 300 of the marginal glaciers have increased their forward speed by 12% since 1990, reducing stress on adjacent ice sheets.

In addition, there is elevation reduction of significant areas, and increased upwelling is accelerating melt of the bottom floating ice shelves.

This is a big unknown, but will certainly be at least 15 cm. (three times the current rate). There is the potential to be much, much more.

##### **MINIMAL TOTALS**

Glaciers 10 to 25 cm

Greenland 48 to 84 cm

Antarctica 10 to 15 cm

Total 98 to 151 cm or 3.3 to 5.0 feet

So we project that we will have at least an additional 3-5 feet of global sea level rise over the coming century. This is a reasonable conservative assessment of what is likely to happen in the coming century. We are constantly seeing positive feedbacks that accelerate initially small forcings and changes. Scientists do not see Arctic warming or Greenland melting as reversible over the coming century.

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#### ENDNOTES and REFERENCES

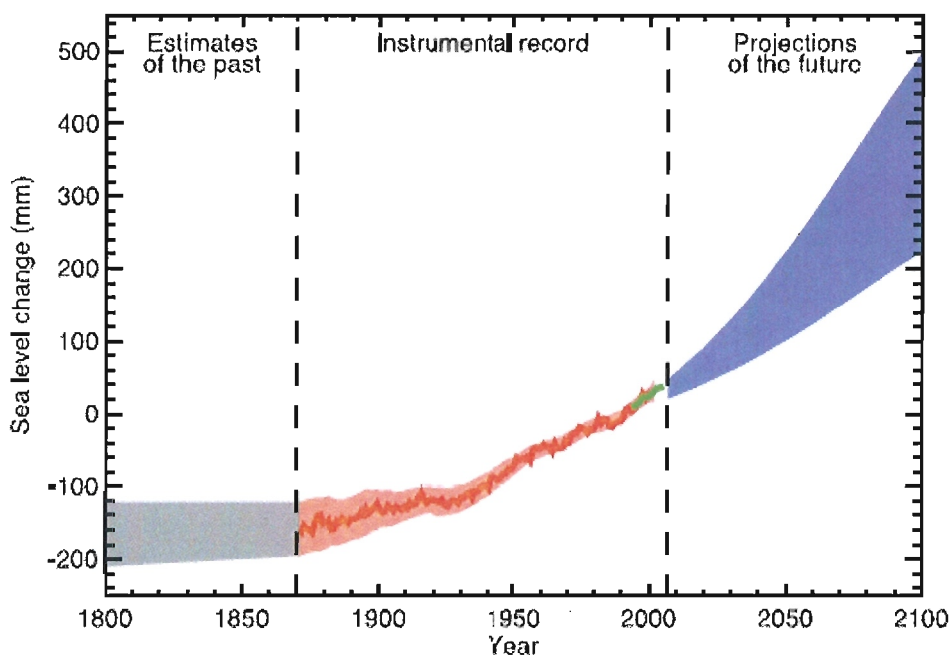
<sup>a</sup> Wanless, H.R., Parkinson, R., and Tedesco, L.P. Sea level control on stability of Everglades wetlands, in *Proceedings of Everglades Modeling Symposium*. St. Lucie Press, FL, p. 199-223.

<sup>b</sup> Ibid. Data on historical sea level is archival tidal gauge data from Miami Harbor Entrance, Key West and Naples, collected and provided online by the National Oceanic and Atmospheric Administration, National Oceans Services (NOAA/NOS). With the advent of satellite altimetry, a global record of ocean level is now available over the past decade. Over that period, global sea level has risen 3 cm – a rate of 30 cm (one foot) per century (see Bindoff, N.L., et al., 2007 IPCC, Working Group 1: *The Physical Science Basis of Climate Change, Fourth Assessment Report 2007*, Chapter 5, report Chapter 5, Observation: Oceanic Climate Changes and Sea Level, page 411 and Figure 5.13.).

<sup>c</sup> Bindoff, N.L., et al., 2007 IPCC, Working Group 1: *The Physical Science Basis of Climate Change, Fourth Assessment Report 2007*, Chapter 5, report Chapter 5, Observation: Oceanic Climate Changes and Sea Level, page 391, Figure 5.2. Also, Levitus, S., J.I. Antonov, and T.P. Boyer, 2005a: Warming of the World Ocean, 1955-2003. *Geophys. Res. Lett.*, **32**, L02604, doi:10.1029/2004 GL021592).

<sup>d</sup> Bindoff, N.L., et al., 2007 IPCC, Working Group 1: *The Physical Science Basis of Climate Change, Fourth Assessment Report 2007*, Chapter 5, report Chapter 5, Observation: Oceanic Climate Changes and Sea Level, page 409, Figure 5.2., and Figure FAQ 5.1-1 (shown below with caption).

**FAQ 5.1, Figure 1.** Time series of global mean sea level (deviation from the 1980-1999 mean) in the past and as projected for the future. For the period before 1870, global measurements of sea level are not available. The grey shading shows the uncertainty in the estimated long-term rate of sea level change (Section 6.4.3). The red line is a reconstruction of global mean sea level from tide gauges (Section 5.5.2.1), and the red shading denotes the range of variations from a smooth curve. The green line shows global mean sea level observed from satellite altimetry. The blue shading represents the range of model projections for the SRES A1B scenario for the 21st century, relative to the 1980 to 1999 mean, and has been calculated independently from the observations. Beyond 2100, the projections are increasingly dependent on the emissions scenario (see Chapter 10 for a discussion of sea level rise projections for other scenarios considered in this report). Over many centuries or millennia, sea level could rise by several metres (Section 10.7.4).



<sup>e</sup> The above published IPCC 2007 diagram does not give a valid indication of sea level for the coming century of because (a) the median and lower projections begin at a lower level and lower slope (rate of rise) than is presently occurring (the green line is the global rate of sea level rise over the past decade); (b) the median rise for the end of the century is basically only a continuation of the current rate of sea level rise, (c) is does not include the rapidly accelerated melting that is and will continue to occur in Greenland and

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projections since they first were made; and (e) it does not include the various effects of the rapidly warming Arctic and Arctic Ocean. The climate scientists web site [realclimate.org](http://www.realclimate.org/index.php/archives/2007/03/the-ipcc-sea-level-numbers/) has a good discussion of this (<http://www.realclimate.org/index.php/archives/2007/03/the-ipcc-sea-level-numbers/>).

<sup>r</sup> The IPCC 2007 report comments that this is occurring but does not incorporate this acceleration into future projections.

<sup>g</sup> These are oral statements made by Dr. Robert Corell, Chair Arctic Climate Impact Assessment, and by Dr. Veli Albert Kallio, Finnish polar/ice scientist, at a meeting in Greenland on September 8, 2007)

<sup>h</sup> Zwally, H.J., Abdalati, W., Herring, T., Larson, K., Saba, J., and Steffen, K., 2007. Surface Melt–Induced Acceleration of Greenland Ice-Sheet Flow, *Science*, vol. 297, p. 218-222.

<sup>i</sup> These feedbacks are now a focus of study in order to better understand exactly to what extent they will drive accelerated melting. Results are emerging for specific aspects at presentations at scientific meetings and in rapid turnaround journals, but it will be some time until an improved understanding of these positive feedbacks become integrated into a coherent global picture. At the recent American Geophysical Union Meeting, there were several sessions on recent research on polar research and ice sheet dynamics. Pfeffer, for example focused on the subglacial rock topography and concluded that ice melt from Greenland could not cause more than about a 2 meter (7 foot) rise in sea level in the coming century (Pfeffer, W.T., 2007. *Kinematic constraints on Greenland Contribution to sea level rise in the next century*, American Geophysical Union, annual Meeting , abstract C53A-02, session on Glacier and Ice Sheet Hydrology).

<sup>j</sup> Ibid.

<sup>k</sup> Ibid.

<sup>l</sup> Widely publicized news with data being provided by NOAA, the National Snow and Ice Data Center and numerous foreign sources. See for example the NSIDC web site:

[http://nsidc.org/news/press/2007\\_seaiceminimum/20071001\\_pressrelease.html](http://nsidc.org/news/press/2007_seaiceminimum/20071001_pressrelease.html).

<sup>m</sup> The climate scientists web site [www.realclimate.org](http://www.realclimate.org) has a prolonged discussion of this concern (<http://www.realclimate.org/index.php/archives/2007/08/arctic-sea-ice-watch/>) and the NSIDC site has maps and discussion of the progressive year to year thinning and loss of area of summer pack ice.

<sup>n</sup> Statement was made by Dr. Veli Albert Kallio, Finnish polar/ice scientist, at a meeting in Greenland on September 8, 2007. In Hansen (2007), cited below, leading climatologist James Hansen evaluates the inadequacy of glacial melt models, the IPCC 2007 sea level projection , the non-linearity of climate and glacial response, and the importance of short and long-term positive feedbacks that will dramatically affect global warming and sea level rise rates, but are not included in IPCC models.

Hansen, J.E., 2007. Scientific reticence and Sea Level Rise. *Environmental Research Letters*, Vol. 2, 024002. doi:10.1088/1748-9326/2/2/024002. Access at: [http://www.iop.org/EJ/article/1748-9326/2/2/024002/erl7\\_2\\_024002.html#erl246875s4](http://www.iop.org/EJ/article/1748-9326/2/2/024002/erl7_2_024002.html#erl246875s4).

<sup>o</sup> From press release by British Antarctic Survey on June 5, 2007. Access at:

[http://www.antarctica.ac.uk/press/press\\_releases/press\\_release.php?id=91](http://www.antarctica.ac.uk/press/press_releases/press_release.php?id=91).

<sup>p</sup> Numerous journal articles and current research findings are finding that the Antarctic is responding to global warming because of slight atmospheric warming and the warming of water s reaching up under the floating ice shelves. Representative citation is: David G. Vaughan, D.G., Holt, J.W., and Blankenship, D.D., 2007. West Antarctic Links to Sea Level Estimation, *EOS, Transactions, American Geophysical Union*, Vol. 88, No. 446, p. 485-487.

Recent findings by NASA have documented widespread melting in west Antarctica in 2005 “up to 900 kilometers (560 miles) inland from the open ocean, farther than 85 degrees south (about 500 kilometers, or 310 miles, from the South Pole) and higher than 2,000 meters (6,600 feet) above sea level.”

(<http://www.jpl.nasa.gov/news/news.cfm?release=2007-058>; and

[http://winds.jpl.nasa.gov/publications/shelf\\_melting.cfm](http://winds.jpl.nasa.gov/publications/shelf_melting.cfm)).

Most recently, Ringolt et al (2008) have reported dramatic increases in melting in the past decade primarily as a result of increased winds increasing ocean upwelling and circulation of warmer waters under the ice shelves. “In West Antarctica, widespread losses along the Bellingshausen and Amundsen seas increased the ice sheet loss by 59% in 10 years to reach 132 60 Gt yr<sup>-1</sup> in 2006. In the Peninsula, losses increased by 140% to reach 60 46 Gt yr<sup>-1</sup> in 2006.” Reference: Eric Rignot, E., Bamber, J.L., van den Broeke, M.R., Davis, C., Yonghong Li, Y., van de Berg, W.J., and van Meijgaard, E., 2008. Recent Antarctic ice mass loss from radar interferometry and regional climate modeling. *Nature Geoscience*, doi:10.1038/ngeo102 (<http://www.nature.com/ngeo/journal/vaop/ncurrent/abs/ngeo102.html>).



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q Committee co-chair Dr. Stephen Leatherman and member Peter Harlem provided a more detailed statement on sea level elevations as follows: For the International Hurricanes Research Center (IHRC) based LIDAR used locally (see reference below), its sea level is at datum NAVD88 which is the new standard and is corrected for problems with sea level in Florida and elsewhere which did not fit the old datum properly. NAVD88 is a fix for NGVD29 which was based on using a benchmark at Galveston, Texas as MLW (the old term for Mean Low Water). Generally, elevations here are actually lower than the old 29 standard found on most USGS maps and the difference can be close to a foot lower. The difference varies from location to location so you just cannot take a fudge factor and subtract it from the old maps to get the correct elevation.

For a description of datum used in the IHRC LIDAR data set see the descriptive document IHRC (2004), page 15. The elevations in IHRC LIDAR data are referenced to NAVD88. NAVD88 is a datum referenced to the terrestrial geoid and not directly translatable to general sea level. A general description of the difference between NAVD88 datum and the NGVD1929 datum is at:

[http://www.ngs.noaa.gov/PUBS\\_LIB/NAVD88/navd88report.htm](http://www.ngs.noaa.gov/PUBS_LIB/NAVD88/navd88report.htm).

National Hurricane Research Center, 2004. *Windstorm Simulation and Modeling Project: Airborne LIDAR DATA and Digital Elevation Models in Miami-Dade, Florida*. Final Report to the Miami-Dade County Enterprise Technology Services Department, 26p. Available online at:

(<http://www.ihrc.fiu.edu/lcr/data/data.htm>) and the metadata of the online LIDAR data distribution site ([http://gis.ihrc.fiu.edu/website/ihrc lidar/metadata/miami\\_dade/metadata.htm](http://gis.ihrc.fiu.edu/website/ihrc lidar/metadata/miami_dade/metadata.htm)).

r The Science and Technology Committee was provided with a 'Climate Change Community Tool Box' by the South Florida regional Planning Council. We have looked at the maps to determine what they used to define elevations. Their +5 foot sea level rise map corresponds closely with the +5 foot contour on the topographic maps in which base level (zero elevation) is mean sea level relative to the datum of 1929 (NGVD 1929). In other words, it appears that their map for +5 foot sea level rise represents conditions at mean sea level prior to the approximately 0.8 feet of sea level rise since the 1929 datum was established. Mean higher high water (MHHW) today is about +2.5 feet above 1929 mean sea level, and with a two-foot rise in sea level would be about +4.5 feet. The +5 foot maps used by the SFRPC appear to reflect MHHW level only for about a sea level rise of about 2.5 feet.

This points out a general concern over mapping future projected sea levels. The maps should convey a number and level that is meaningful to the public and decision makers. Mean higher high water (MHHW) is a level that is reached on the average of twice a month. Some spring tides exceed this level by as much as a foot, but MHHW provides a level that is more meaningful than MSL when considering drainage, flooding, habitation, and wetlands.

s Since issuing this statement in September, 2007, several scientists of the IPCC have given very positive reviews of this statement (and none have criticized it). In addition, review articles in *Science* and elsewhere have made estimates similar to those in this statement. See also endnote 'n'.

Kerr, R.A., 2007. Pushing the scary side of global warming. *Science*, v. 316, p. 1412-1414.

t Meier, M.F., et al., 2007. Glaciers Dominate Eustatic Sea-Level Rise in the 21st Century, *Science*, vol. 317, p. 1064-1066; DOI: 10.1126/science.1143906